US008238553B2

(12) United States Patent
Moskowitz et al.

(10) Patent No.: US 8,238,553 B2
(45) Date of Patent: *Aug. 7, 2012

(54) **STEGANOGRAPHIC METHOD AND DEVICE**

(75) Inventors: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US); **Marc Cooperman**, Short Hills, NJ (US)

(73) Assignee: **Wistaria Trading, Inc**, Sunny Isles Beach, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/383,916**

(22) Filed: **Mar. 30, 2009**

(65) **Prior Publication Data**

US 2009/0220074 A1 Sep. 3, 2009

Related U.S. Application Data

(60) Continuation of application No. 08/999,766, filed on Jul. 23, 1997, now Pat. No. 7,568,100, which is a division of application No. 08/775,216, filed on Dec. 31, 1996, now Pat. No. 5,687,236, which is a continuation of application No. 08/489,172, filed on Jun. 7, 1995, now Pat. No. 5,613,004.

(51) **Int. Cl.**
H04N 7/167 (2011.01)

(52) **U.S. Cl.** **380/231**; 713/176; 705/57; 726/32

(58) **Field of Classification Search** 713/176; 380/231; 705/57; 726/32

See application file for complete search history.

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4,218,582	A	8/1980	Hellman et al.
4,339,134	A	7/1982	Macheel
4,390,898	A	6/1983	Bond et al.
4,405,829	A	9/1983	Rivest et al.
4,424,414	A	1/1984	Hellman et al.
4,528,588	A	7/1985	Lofberg
4,672,605	A	6/1987	Hustig et al.
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4,827,508	A	5/1989	Shear
4,876,617	A	10/1989	Best et al.
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4,908,873	A	3/1990	Philibert et al.
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4,979,210	A	12/1990	Nagata et al.
4,980,782	A	12/1990	Ginkel
5,050,213	A	9/1991	Shear
5,073,925	A	12/1991	Nagata et al.
5,077,665	A	12/1991	Silverman et al.
5,113,437	A	5/1992	Best et al.
5,136,581	A	8/1992	Muehrcke
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5,136,647	A	8/1992	Haber et al.
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5,161,210	A	11/1992	Druyvesteyn et al.
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5,243,423	A	9/1993	DeJean et al.
5,243,515	A	9/1993	Lee
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5,394,324	A	2/1995	Clearwater
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Primary Examiner — Eleni Shiferaw
Assistant Examiner — Paul Callahan
(74) *Attorney, Agent, or Firm* — Neifeld IP Law, PC

(57) **ABSTRACT**

An apparatus and method for encoding and decoding additional information into a stream of digitized samples in an integral manner. The information is encoded using special keys. The information is contained in the samples, not prepended or appended to the sample stream. The method makes it extremely difficult to find the information in the samples if the proper keys are not possessed by the decoder. The method does not cause a significant degradation to the sample stream. The method is used to establish ownership of copyrighted digital multimedia content and provide a disincentive to piracy of such material.

108 Claims, No Drawings

US 20120209955A1

(19) **United States**

(12) **Patent Application Publication**

Moskowitz et al.

(10) **Pub. No.: US 2012/0209955 A1**

(43) **Pub. Date: Aug. 16, 2012**

(54) **SECURE PERSONAL CONTENT SERVER**

(76) Inventors: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US); **Mike W. Berry**, Seattle, WA (US)

(21) Appl. No.: **13/413,691**

(22) Filed: **Mar. 7, 2012**

Related U.S. Application Data

(63) Continuation of application No. 12/287,443, filed on Oct. 9, 2008, now Pat. No. 8,171,561, which is a continuation of application No. 10/049,101, filed on Jul. 23, 2002, now Pat. No. 7,475,246, filed as application No. PCT/US00/21189 on Aug. 4, 2000.

(60) Provisional application No. 60/147,134, filed on Aug. 4, 1999, provisional application No. 60/213,489, filed on Jun. 23, 2000.

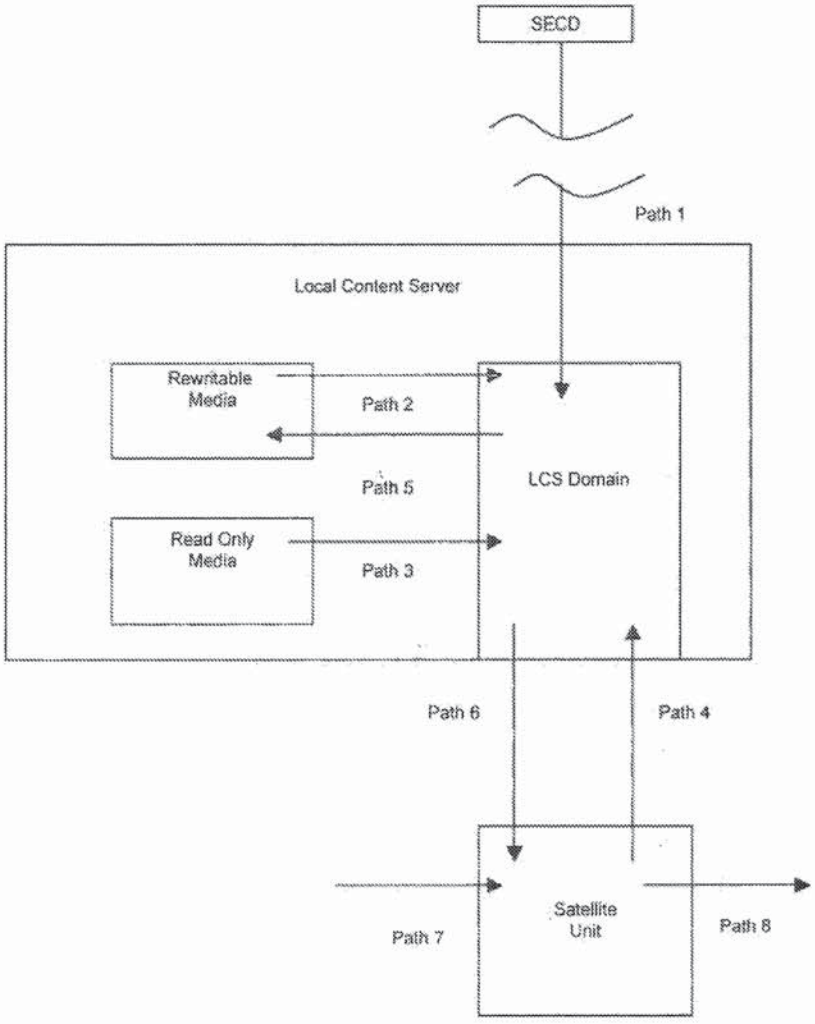
Publication Classification

(51) **Int. Cl.**
G06F 15/16 (2006.01)

(52) **U.S. Cl.** **709/217**

(57) **ABSTRACT**

A local content server system (LCS) for creating a secure environment for digital content is disclosed, which system comprises: a communications port in communication for connecting the LCS via a network to at least one Secure Electronic Content Distributor (SECD), which SECD is capable of storing a plurality of data sets, is capable of receiving a request to transfer at least one content data set, and is capable of transmitting the at least one content data set in a secured transmission; a rewritable storage medium whereby content received from outside the LCS may be stored and retrieved; a domain processor that imposes rules and procedures for content being transferred between the LCS and devices outside the LCS; and a programmable address module which can be programmed with an identification code uniquely associated with the LCS. The LCS is provided with rules and procedures for accepting and transmitting content data.



US008265278B2

(12) **United States Patent**
Moskowitz et al.

(10) **Patent No.: US 8,265,278 B2**
(45) **Date of Patent: *Sep. 11, 2012**

(54) **SYSTEM AND METHODS FOR PERMITTING OPEN ACCESS TO DATA OBJECTS AND FOR SECURING DATA WITHIN THE DATA OBJECTS**

(75) Inventors: **Scott Moskowitz**, Sunny Isles Beach, FL (US); **Mike W. Berry**, Seattle, WA (US)

(73) Assignee: **Blue Spike, Inc.**, Sunny Isles Beach, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/886,732**

(22) Filed: **Sep. 21, 2010**

(65) **Prior Publication Data**

US 2011/0026709 A1 Feb. 3, 2011

Related U.S. Application Data

(63) Continuation of application No. 12/383,879, filed on Mar. 30, 2009, now Pat. No. 7,813,506, which is a continuation of application No. 11/647,861, filed on Dec. 29, 2006, now Pat. No. 7,532,725, which is a continuation of application No. 09/731,039, filed on Dec. 7, 2000, now Pat. No. 7,177,429.

(60) Provisional application No. 60/169,274, filed on Dec. 7, 1999, provisional application No. 60/234,199, filed on Sep. 20, 2000.

(51) **Int. Cl.**
H04K 1/02 (2006.01)

(52) **U.S. Cl.** **380/252**

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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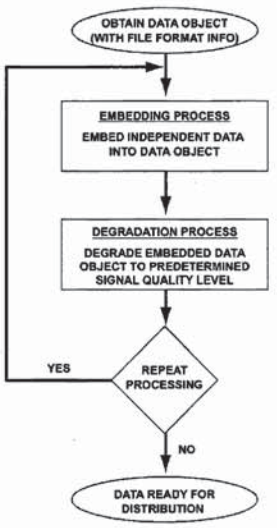
(Continued)

Primary Examiner — Brandon Hoffman
(74) *Attorney, Agent, or Firm* — Neifeld IP Law, PC

(57) **ABSTRACT**

A system and methods for permitting open access to data objects and for securing data within the data objects is disclosed. According to one embodiment of the present invention, a method for securing a data object is disclosed. According to one embodiment of the present invention, a method for securing a data object is disclosed. The method includes the steps of (1) providing a data object comprising digital data and file format information; (2) embedding independent data into a data object; and (3) scrambling the data object to degrade the data object to a predetermined signal quality level. The steps of embedding and scrambling may be performed until a predetermined condition is met. The method may also include the steps of descrambling the data object to upgrade the data object to a predetermined signal quality level, and decoding the embedded independent data. The additional steps of descrambling and decoding may be performed until a predetermined condition is met. The predetermined condition may include, for example, reaching a desired signal quality of the data object.

18 Claims, 2 Drawing Sheets



US 20120239686A1

(19) **United States**

(12) **Patent Application Publication**

Moskowitz et al.

(10) **Pub. No.: US 2012/0239686 A1**

(43) **Pub. Date: Sep. 20, 2012**

(54) **METHOD AND DEVICE FOR MONITORING AND ANALYZING SIGNALS**

(76) Inventors: **Scott Moskowitz**, Sunny Isles Beach, FL (US); **Mike W. Berry**, Seattle, WA (US)

(21) Appl. No.: **13/487,119**

(22) Filed: **Jun. 1, 2012**

Related U.S. Application Data

(63) Continuation of application No. 13/035,964, filed on Feb. 26, 2011, now Pat. No. 8,214,175, which is a continuation of application No. 12/655,357, filed on Dec. 22, 2009, now Pat. No. 7,949,494, which is a continuation of application No. 12/005,229, filed on Dec. 26, 2007, now Pat. No. 7,660,700, which is a continuation of application No. 09/657,181, filed on Sep. 7, 2000, now Pat. No. 7,346,472.

Publication Classification

(51) **Int. Cl.**
G06F 17/30 (2006.01)

(52) **U.S. Cl.** **707/769**; 707/E17.014

(57) **ABSTRACT**

A method and system for monitoring and analyzing at least one signal are disclosed. An abstract of at least one reference signal is generated and stored in a reference database. An abstract of a query signal to be analyzed is then generated so that the abstract of the query signal can be compared to the abstracts stored in the reference database for a match. The method and system may optionally be used to record information about the query signals, the number of matches recorded, and other useful information about the query signals. Moreover, the method by which abstracts are generated can be programmable based upon selectable criteria. The system can also be programmed with error control software so as to avoid the re-occurrence of a query signal that matches more than one signal stored in the reference database.

US008281140B2

(12) **United States Patent**
Moskowitz

(10) **Patent No.: US 8,281,140 B2**
(45) **Date of Patent: *Oct. 2, 2012**

(54) **OPTIMIZATION METHODS FOR THE INSERTION, PROTECTION, AND DETECTION OF DIGITAL WATERMARKS IN DIGITAL DATA**

(75) Inventor: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US)

(73) Assignee: **Wistaria Trading, Inc**, Sunny Isles Beach, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 246 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/592,331**

(22) Filed: **Nov. 23, 2009**

(65) **Prior Publication Data**

US 2010/0077220 A1 Mar. 25, 2010

Related U.S. Application Data

(60) Continuation of application No. 11/599,964, filed on Nov. 15, 2006, now Pat. No. 7,647,502, which is a continuation of application No. 11/497,822, filed on Aug. 2, 2006, now Pat. No. 7,457,962, which is a division of application No. 09/789,711, filed on Feb. 22, 2001, now Pat. No. 7,107,451, which is a continuation-in-part of application No. 09/281,279, filed on Mar. 30, 1999, now Pat. No. 6,522,767, which is a continuation of application No. 08/677,435, filed on Jul. 2, 1996, now Pat. No. 5,889,868.

(51) **Int. Cl.**
H04L 9/00 (2006.01)

(52) **U.S. Cl.** **713/176**

(58) **Field of Classification Search** 713/176
See application file for complete search history.

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4,424,414	A	1/1984	Hellman et al.
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4,827,508	A	5/1989	Shear
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4,939,515	A	7/1990	Adelson
4,969,204	A	11/1990	Jones et al.
4,972,471	A	11/1990	Gross et al.
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4,980,782	A	12/1990	Ginkel
5,050,213	A	9/1991	Shear
5,073,925	A	12/1991	Nagata et al.
5,077,665	A	12/1991	Silverman et al.
5,111,530	A	5/1992	Kutaragi
5,113,437	A	5/1992	Best et al.
5,136,581	A	8/1992	Muehrcke
5,136,646	A	8/1992	Haber et al.
5,136,647	A	8/1992	Haber et al.
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Primary Examiner — Matthew Smithers

(74) *Attorney, Agent, or Firm* — Neifeld IP Law, PC

(57) **ABSTRACT**

Disclosed herein are methods and systems for encoding digital watermarks into content signals. Also disclosed are systems and methods for detecting and/or verifying digital watermarks in content signals. According to one embodiment, a system for encoding of digital watermark information includes: a window identifier for identifying a sample window in the signal; an interval calculator for determining a quantization interval of the sample window; and a sampler for normalizing the sample window to provide normalized samples. According to another embodiment, a system for pre-analyzing a digital signal for encoding at least one digital watermark using a digital filter is disclosed. According to another embodiment, a method for pre-analyzing a digital signal for encoding digital watermarks comprises: (1) providing a digital signal; (2) providing a digital filter to be applied to the digital signal; and (3) identifying an area of the digital signal that will be affected by the digital filter based on at least one measurable difference between the digital signal and a counterpart of the digital signal selected from the group consisting of the digital signal as transmitted, the digital signal as stored in a medium, and the digital signal as played backed. According to another embodiment, a method for encoding a watermark in a content signal includes the steps of (1) splitting a watermark bit stream; and (2) encoding at least half of the watermark bit stream in the content signal using inverted instances of the watermark bit stream. Other methods and systems for encoding/decoding digital watermarks are also disclosed.

20 Claims, No Drawings

US008307213B2

(12) **United States Patent**
Moskowitz et al.

(10) **Patent No.: US 8,307,213 B2**
(45) **Date of Patent: *Nov. 6, 2012**

(54) **METHOD AND SYSTEM FOR DIGITAL WATERMARKING**

(75) Inventors: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US); **Marc S. Cooperman**, Short Hills, NJ (US)

(73) Assignee: **Wistaria Trading, Inc.**, Sunny Isles Beach, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 8 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/803,168**

(22) Filed: **Jun. 21, 2010**

(65) **Prior Publication Data**

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Related U.S. Application Data

(60) Continuation of application No. 12/005,230, filed on Dec. 26, 2007, now Pat. No. 7,770,017, which is a continuation of application No. 11/244,213, filed on Oct. 5, 2005, now Pat. No. 7,343,492, which is a division of application No. 09/545,589, filed on Apr. 7, 2000, now Pat. No. 7,007,166, which is a continuation of application No. 08/674,726, filed on Jul. 2, 1996, now Pat. No. 7,362,775.

(51) **Int. Cl.**
G06F 21/00 (2006.01)

(52) **U.S. Cl.** **713/176**

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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4,339,134	A	7/1982	Macheel
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4,827,508	A	5/1989	Shear
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4,980,782	A	12/1990	Ginkel
5,050,213	A	9/1991	Shear
5,073,925	A	12/1991	Nagata et al.
5,077,665	A	12/1991	Silverman et al.
5,113,437	A	5/1992	Best et al.
5,136,581	A	8/1992	Muehrcke
5,136,646	A	8/1992	Haber et al.
5,136,647	A	8/1992	Haber et al.
5,142,576	A	8/1992	Nadan
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5,210,820	A	5/1993	Kenyon
5,243,423	A	9/1993	DeJean et al.
5,243,515	A	9/1993	Lee
5,287,407	A	2/1994	Holmes
5,319,735	A	6/1994	Preuss et al.
5,341,429	A	8/1994	Stringer et al.
5,341,477	A	8/1994	Pitkin et al.
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5,365,586	A	11/1994	Indeck et al.
5,369,707	A	11/1994	Follendore, III
5,379,345	A	1/1995	Greenberg
5,394,324	A	2/1995	Clearwater
5,398,285	A	3/1995	Borgelt et al.
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5,408,505	A	4/1995	Indeck et al.
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US. Appl. No. 08/999,766, filed Jul. 23, 1997, entitled "Steganographic Method and Device".

(Continued)

Primary Examiner — Benjamin Lanier
(74) *Attorney, Agent, or Firm* — Neifeld IP Law, PC

(57) **ABSTRACT**

A method for applying a digital watermark to a content signal is disclosed. In accordance with such a method, a watermarking key is identified. The watermarking key includes a binary sequence and information describing application of that binary sequence to the content signal. The digital watermark is then encoded within the content signal at one or more locations determined by the watermarking key.

44 Claims, No Drawings

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(19) **United States**

(12) **Patent Application Publication**

Moskowitz et al.

(10) **Pub. No.: US 2012/0300928 A1**

(43) **Pub. Date: Nov. 29, 2012**

(54) **SYSTEM AND METHODS FOR PERMITTING OPEN ACCESS TO DATA OBJECTS AND FOR SECURING DATA WITHIN THE DATA OBJECTS**

(76) Inventors: **Scott Moskowitz**, Sunny Isles Beach, FL (US); **Mike W. Berry**, Seattle, WA (US)

(21) Appl. No.: **13/572,641**

(22) Filed: **Aug. 11, 2012**

Related U.S. Application Data

(63) Continuation of application No. 12/886,732, filed on Sep. 21, 2010, now Pat. No. 8,265,278, which is a continuation of application No. 12/383,879, filed on Mar. 30, 2009, now Pat. No. 7,813,506, which is a continuation of application No. 11/647,861, filed on Dec. 29, 2006, now Pat. No. 7,532,725, which is a continuation of application No. 09/731,039, filed on Dec. 7, 2000, now Pat. No. 7,177,429.

(60) Provisional application No. 60/169,274, filed on Dec. 7, 1999, provisional application No. 60/234,199, filed on Sep. 20, 2000.

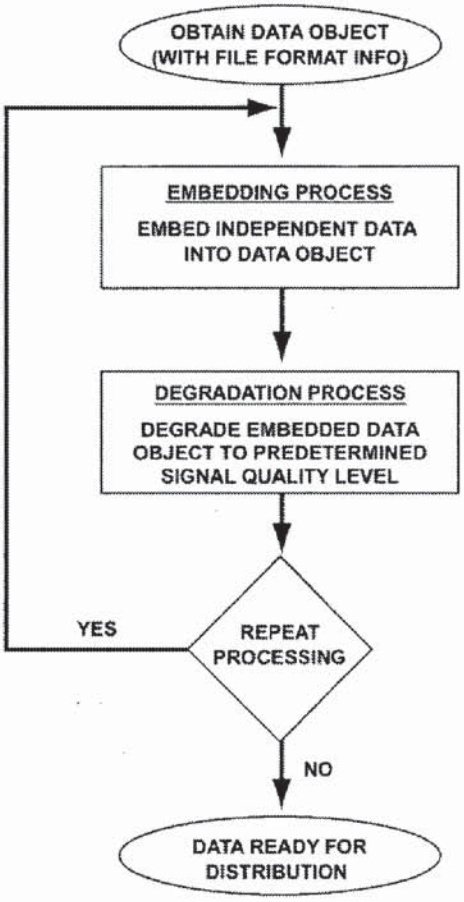
Publication Classification

(51) **Int. Cl.**
H04K 1/02 (2006.01)

(52) **U.S. Cl.** **380/252**

(57) **ABSTRACT**

A system and methods for permitting open access to data objects and for securing data within the data objects is disclosed. According to one embodiment of the present invention, a method for securing a data object is disclosed. According to one embodiment of the present invention, a method for securing a data object is disclosed. The method includes the steps of (1) providing a data object comprising digital data and file format information; (2) embedding independent data into a data object; and (3) scrambling the data object to degrade the data object to a predetermined signal quality level. The steps of embedding and scrambling may be performed until a predetermined condition is met. The method may also include the steps of descrambling the data object to upgrade the data object to a predetermined signal quality level, and decoding the embedded independent data.



US 20120278627A1

(19) **United States**

(12) **Patent Application Publication**

Moskowitz

(10) **Pub. No.: US 2012/0278627 A1**

(43) **Pub. Date: Nov. 1, 2012**

(54) **SECURITY BASED ON SUBLIMINAL AND SUPRALIMINAL CHANNELS FOR DATA OBJECTS**

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Related U.S. Application Data

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H04L 9/00 (2006.01)

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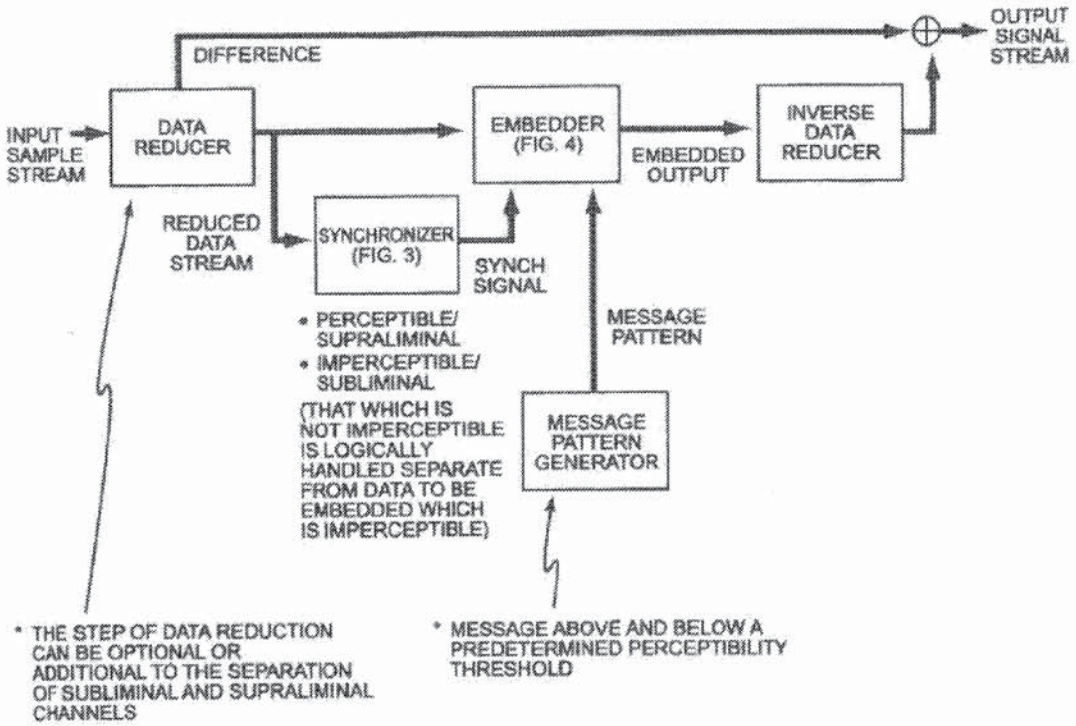
(57) **ABSTRACT**

This invention relates to security for data objects; more particularly, the present invention relates to improved security based on subliminal and supraliminal channels for data objects. In another embodiment, a method of protecting a data object comprises: steganographically encoding a subset of candidate bits in a digitized sample stream; perceptibly manipulating data in the digitized sample stream; and combining the imperceptible and perceptible data changes to create a secure/unique digital sample stream. In yet another embodiment, a method for securing a data signal comprises: preanalyzing said data signal for candidate watermark/signature bits; steganographically encoding independent data into the data signal into a subset of the candidate watermark bits, at least one time; and encoding the data signal subsequently with a perceptible technique.



EMBEDDING SYSTEM

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(54) **METHODS, SYSTEMS AND DEVICES FOR PACKET WATERMARKING AND EFFICIENT PROVISIONING OF BANDWIDTH**

(76) Inventor: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US)

(21) Appl. No.: **13/551,097**

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Related U.S. Application Data

(60) Division of application No. 11/900,065, filed on Sep. 10, 2007, now Pat. No. 8,224,705, which is a division of application No. 10/417,231, filed on Apr. 17, 2003, now Pat. No. 7,287,275, Continuation of application No. 13/273,930, filed on Oct. 14, 2011, which is a continuation of application No. 12/383,289, filed on Mar. 23, 2009, now Pat. No. 8,104,079, which is a continuation of application No. 11/900,066, filed on Sep. 10, 2007, now Pat. No. 7,530,102, which is a continuation of application No. 10/417,231, filed on Apr. 17, 2003, now Pat. No. 7,287,275.

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(51) **Int. Cl.**
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(52) **U.S. Cl.** **705/26.1**

(57) **ABSTRACT**

Disclosed herein are methods and systems for transmitting streams of data. The present invention also relates to generating packet watermarks and packet watermark keys. The present invention also relates to a computerized system for packaging data for transmission to a user. The system may utilize computer code to generate a bandwidth rights certificate that may include: at least one cryptographic credential; routing information for the transmission; and, optionally, a digital signature of a certificate owner; a unique identification code of a certificate owner; a certificate validity period; and pricing information for use of bandwidth. The present invention also relates to an electronic method and system for purchasing good and services by establishing an account whereby a customer is credited with a predetermined amount of bandwidth usage, and then charges are assessed against the account in an amount of bandwidth usage which corresponds to the agreed upon purchase value for the selected item.

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(54) **DATA PROTECTION METHOD AND DEVICE**

(76) Inventor: **Scott A. Moskowitz**, Sunny Isles Beach, FL (US)

(21) Appl. No.: **13/556,420**

(22) Filed: **Jul. 24, 2012**

Related U.S. Application Data

(60) Continuation of application No. 11/895,388, filed on Aug. 24, 2007, which is a division of application No. 10/602,777, filed on Jun. 25, 2003, now Pat. No. 7,664,263, which is a continuation of application No. 09/046,627, filed on Mar. 24, 1998, now Pat. No. 6,598,162.

Publication Classification

(51) **Int. Cl.**
G06F 21/24 (2006.01)

(52) **U.S. Cl.** **726/26**

(57) **ABSTRACT**

An apparatus and method for encoding and decoding additional information into a digital information in an integral manner. More particularly, the invention relates to a method and device for data protection.